

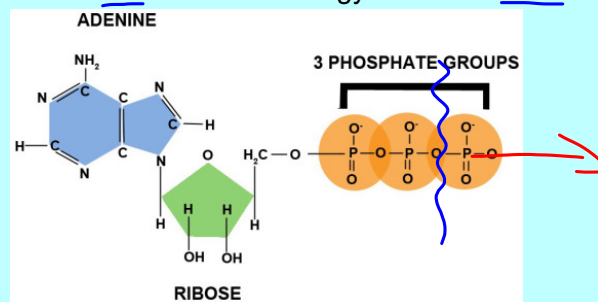
How do we get the energy that we require to carry out our everyday activities?

- carbs
- fats
- proteins

<https://www.youtube.com/watch?v=Gh2P5CmCC0M>

Cellular Respiration

- occurs mostly in the mitochondria of living cells/first part does occur in cytoplasm
- food(nutrients) are gradually broken down to provide the cell energy...you don't "burn" your food directly
- its like changing a \$5 bill into 2 toonies and a loonie so you can use the vending machine
- * - glucose (sugar) provides most of the energy needed, but needs to be converted into ATP (adenosine triphosphate) first.
- think of ATP as a rechargeable battery that releases small amounts of energy when your cells need it
- * - when ATP releases energy it becomes ADP *diphosphate*



Cellular Respiration is a 3 step process

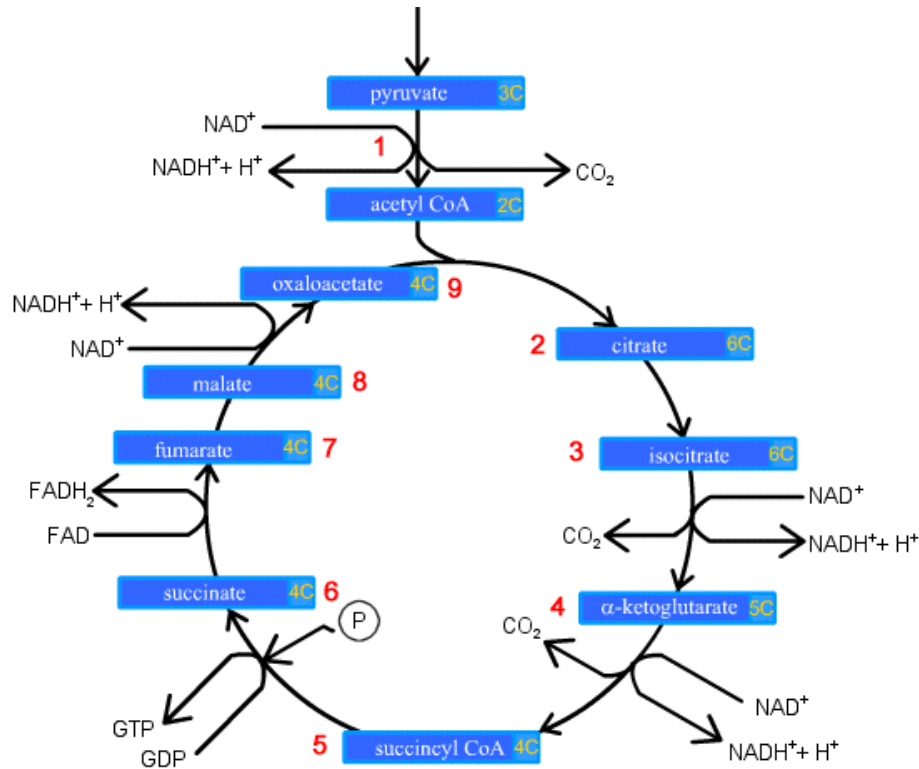
Step 1 **Glycolysis** occurs in the cytoplasm

- $C_6H_{12}O_6$ (glucose) is broken down into 2, 3 carbon compounds called Pyruvate ($C_3H_6O_3$) and electrons will be released
- A molecule called NADH accepts the electrons for use later
- NADH *takes them to the mitochondria* ~~is found inside the mitochondria~~
- ~~2 ATP molecules are also produced~~ *Pyruvate also diffuses into the mitochondria*
- (this can be done anaerobically as well ~~and lactic acid is produced~~)



- like splitting kindling before starting a fire
- occurs outside the stove

Step 2 The Krebs Cycle



- in more simple terms.....

- the Krebs cycle occurs in the mitochondria

- pyruvate is converted into acetyl CoA which is a 2 carbon compound

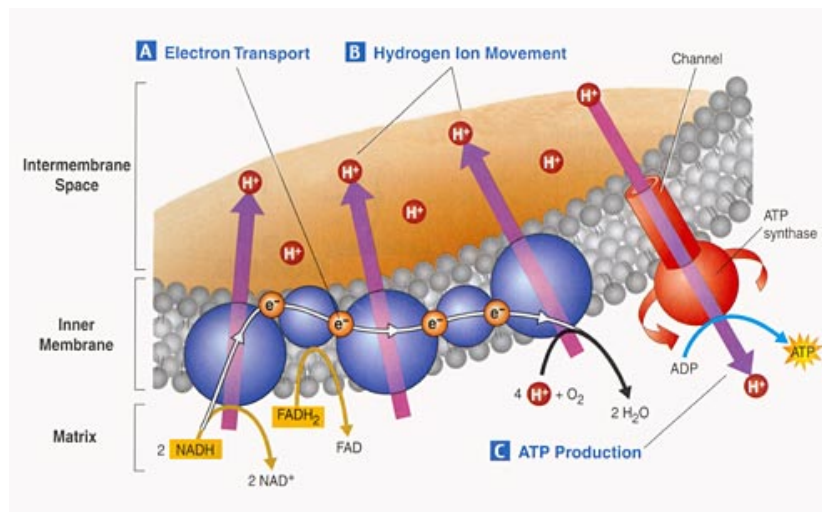
- the left over C will be used to form of CO_2



- some high energy electrons are also created and held by NADH and FADH

Step 3 Electron Transport Chain

- the electrons stored in NADH and FADH will be released
- the electrons will travel through the electron transport chain and their energy will be stored as hydrogen ions.

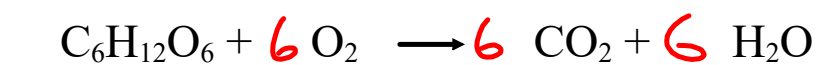


charged up

- as the ^{charged up} hydrogen ions build up they diffuse through ATP synthase (a protein channel) and are used to re-charge ADP into ATP
- as the electrons use up their energy they are picked up by oxygen and oxygen then combines with excess hydrogen ions to form water

Formula:

Glucose + Oxygen \longrightarrow Carbon Dioxide + Water



1. What type of food needs to be consumed to provide you with energy?
2. What type of organisms go through cellular respiration?
3. Where does cellular respiration occur?
4. What is food converted into to provide you with energy?
5. How many steps are there in cellular respiration? What is the name of the first one?